

*Handwritten: 4/10/74, Dick, RBP, [unclear] for speakers*

Statement of

MAR 21 1974

Dr. James C. Fletcher  
Administrator

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION

before the

Committee on Science and Astronautics  
House of Representatives

Mr. Chairman and Members of the Committee:

We are pleased to appear before the Committee today to present an overall summary of NASA's FY 1975 authorization request, and to discuss with you the main features of the programs in aeronautics and space we are recommending for the coming year. In the course of my statement, I will also discuss briefly the organizational changes within NASA which went into effect on March 15 of this year and the other topics you have asked that we address on this occasion. In response to your invitation, Mr. Chairman, we will also have presentations on some examples of benefits coming out of the space program and have others on display here in the Committee room. Dr. Low will introduce this part of the program later on. I should also note that we are supplying for the record comprehensive statements on Research and Program Management, Construction of Facilities, Equal Employment Opportunity, and the NASA integrated Life Sciences program.

Accompanying me today, in addition to Dr. George M. Low, the Deputy Administrator, are Dr. Rocco Petrone, our new Associate Administrator; Mr. Willis H. Shapley, Associate Deputy Administrator; and Mr. William E. Lilly, the NASA Comptroller. Also present are the principal officials in charge of the NASA programs we will discuss today, who have already appeared before the various Subcommittees of this Committee to discuss NASA's programs for the coming year in detail.

Mr. Chairman, during the past year NASA has produced many outstanding accomplishments.

On February 8 of this year the flight phase of the Skylab program came to a successful end with the splashdown of Skylab 4. During the Skylab mission, three crews of Skylab astronauts traveled over 61 million nautical miles in space and orbited the earth 2,475 times in a working scientific laboratory -- a giant step toward the routine use of space for science and for practical benefits.

As Skylab was demonstrating the importance of near-earth space, Pioneer 10 swept past the planet Jupiter on December 3 of last year. Pioneer 10 made hundreds of scientific measurements of the giant planet, its inner moons, and its mysterious Red Spot. We found that Jupiter has a magnetic field 20 times as strong as the earth's; a powerful, strangely configured radiation belt; the surprising presence

of helium, and many other new features of the largest planet in our solar system and its moons. Pioneer 10 was the first spacecraft to fly beyond the orbit of Mars, the first to penetrate the Asteroid Belt, and will be the first man-made object ultimately to escape the solar system.

On February 5 of this year Mariner 10 approached to within 3,600 miles of Venus on its way to Mercury. In passing Venus, Mariner 10 returned over 4,000 television pictures, the first closeup views of that planet. Pictures of Venus' upper atmosphere revealed for the first time a multilayered cloud structure. These pictures also detected an upper atmospheric circulation pattern that is in some respects rather amazing -- that is, that Venus' upper atmosphere rotates around the planet approximately 60 times faster than the planet itself rotates.

1973 will also be marked as the year the earth resources survey program came of age. After its first full year of operation, the Earth Resources Technology Satellite ERTS-1 has acquired and relayed to earth over 100,000 multi-spectral scenes of our planet - more than a billion square miles of

coverage. We have provided over a million copies of these images to Federal and State agencies, resource managers, and investigators here and abroad. The operational values of remote sensing from space are rapidly becoming apparent across a wide spectrum of needs. The full benefits of even ERTS-1 have not yet been tallied, but a current study underway by the Department of Interior is showing that very significant returns above cost can be expected from a continuing earth resource survey satellite program.

Another major milestone in 1973 was the consumation, last September, of our agreement with nine European nations on the Spacelab, under which the Europeans will develop, at their expense, the laboratory module to be used with the Space Shuttle. This agreement marks a new high level in international cooperation and in international cost-sharing in the U.S. space program, and will provide a key piece of equipment for realizing the full utility of the Space Shuttle.

During the past year we also made significant progress in other programs. Some examples:

Space Shuttle design and development proceeded well. All major prime hardware contractors have been selected, although, as you know, the contract award for the Solid Rocket Motors is currently under protest. We now have completed and published our comprehensive analysis of the number and kinds of payloads we could launch with the Shuttle during its first 12 years of operations. The analysis confirms our previous estimates that we can expect savings resulting from the use of

the Shuttle of over \$1 billion a year during that 12-year period. You may wish to include in the record of these hearings portions of the final report of our economic analyses which we sent to the Committee recently.

In aeronautics we continued to attack problems of aircraft noise and pollution and extended our efforts to enhance safety and improve aircraft fuel economy.

From flight tests with aircraft incorporating NASA technological advances such as the "supercritical wing" we estimate that a total potential fuel savings of 30% in the operation of civil transport aircraft is possible. Substantial progress has also been made in the JT8D engine refan noise reduction program. Ground testing of this engine modified with NASA-developed technology has already begun.

Finally, technological benefits of NASA's programs are continuing to flow into our economy and make useful contributions to important national and human interests, as you can see from the exhibits around this room. These exhibits here today are only a few examples of the technological benefits the nation is receiving from NASA's space and aeronautics programs.

Mr. Chairman, we have prepared a more comprehensive statement on last year's highlights, and we would be glad to furnish it for the record if you wish.

I should report briefly on three problems we have had. Two of the three have already been discussed in detail before the appropriate Subcommittees of this Committee.

First, there was the problem of the near catastrophic damage to Skylab when the micrometeorite shield broke away

carrying with it one of the solar panels and leaving the Skylab without sufficient insulation from the sun's heat. As you all know, the damage was repaired in a dramatic effort by the team on the ground and the astronauts in space, and the mission was an outstanding success.

Second, we are experiencing technical developmental difficulties in the Viking program with some of the exceedingly complex equipment required for landing and conducting automated scientific experiments on the surface of Mars. Because these difficulties have been greater than had been envisioned, we have now had to accept the likelihood of an overrun of approximately 10% in the projected total cost of \$838 million we estimated for Viking research and development four years ago. We will shortly be submitting to the Congress a reprogramming action covering the adjustments necessary in our FY 1974 budget plan. Further adjustments required in our FY 1975 budget will depend on progress in resolving the technical problems and the effectiveness of efforts by NASA and our contractors to control costs.

Third, as the Committee is aware, we have had problems in our Equal Employment Opportunity program. In hearings before Senate committees and the House Subcommittee on Civil Rights and Constitutional Rights, we have been frank to say that NASA has not done as well as we should

in this area. We have recently taken measures to strengthen our EEO programs and have set ourselves specific goals and timetables for 1974. With NASA's civil service employment now stabilized, with no further across-the-board reductions in force required, I believe these goals, while difficult, are attainable and will be met.

Now, Mr. Chairman, I would like to address our programs and budget for the coming year.

As shown in the table attached to my statement, NASA's FY 1975 request for authorization and appropriations totals \$3.247 billion. This is an increase of slightly more than \$200 million over FY 1974 appropriations, but only of about \$100 million over our current budget plan for FY 1974 because FY 1973 funds have financed some of the FY 1974 budget plan.

You will recall that NASA's FY 1974 budget reflected a sharp temporary reduction, because of Government-wide fiscal problems at that time, to below the \$3.4 billion level previously planned as the long-term NASA budget level and approved by Congress for FY 1973. Last year, the need was clearly recognized for increases in the NASA budget in FY 1975 and subsequent years in order to again approach the level required to maintain a balanced program of continuing advances in space and aeronautics.

The FY 1975 budget does provide an increase for NASA, as I have indicated. However, because of the financial constraints within which the President's overall FY 1975 budget has been prepared, the increase provided is less than would have been

required to maintain NASA's entire program as planned last year, after taking into account the effects of inflation and other necessary adjustments.

We have been obliged, therefore, to make some program adjustments, the principal one being in the development schedule for the Space Shuttle. Under this and predicted future budgets, the first manned orbital flight of the Shuttle is now expected to occur in the second quarter of 1979 instead of at the end of 1978, a change of from 4 to 6 months. A firm schedule is extremely important in a large-scale complex development program like the space Shuttle. Projected increases in future NASA funding levels should enable us to avoid further schedule changes in the Space Shuttle program, and at the same time maintain continuity and balance in other NASA programs within the previously planned total NASA budget levels.

To provide continuity and balance in our overall program, we have initiated this year three important new flight projects in space science and applications -- Pioneer Venus, SEASAT, and a Heat Capacity Mapping Mission (HCMM).

Pioneer Venus. Detailed study of the composition and global dynamics of the atmosphere of Venus, 100 times more dense than the earth's, will give us a better understanding both of that planet and of the forces that drive the earth's atmosphere, meteorology, and climatology. Two Atlas-Centaur launched missions will fly to Venus in 1978. One will send entry probes into four locations in the Venus atmosphere to measure the composition and global dynamics of that atmosphere.



The other will place a spacecraft in orbit about the planet to study the characteristics of the atmosphere and their temporal changes.

SEASAT will be a specialized experimental applications satellite. It will observe and measure the oceans, both to develop a scientific understanding of ocean dynamics and to determine the feasibility of developing an ocean dynamics forecasting system which could be of great economic value to the shipping and fishing industries, for example. SEASAT-A will be launched in 1978. We are working closely in this program with the National Oceanographic and Atmospheric Administration (NOAA), the Coast Guard, and the Navy.

Heat Capacity Mapping Mission (HCMM) - This will be another specialized experimental applications project. It will use a small "Explorer-type" satellite to make thermal measurements of the earth's surface. These measurements will be used to identify favorable locations for further ground investigations which will determine our ability to discriminate rock types and rock structures on a regional basis. This discrimination can be of major value in locating targets for the further exploration of mineral resources and in the planning of the construction of major civil works such as highways and canals. The measurements will also be used to investigate further the feasibility of locating geothermal sources by remote mapping from a spacecraft. The HCMM will be launched on a Scout launch vehicle in 1977. The Department of Interior is working with us on this project.

Let me also mention another new item of interest in our FY 1975 program. We plan to build an infrared telescope facility to be used primarily to provide supporting and complementary data to our planetary exploration and astronomical missions. For instance, it is very important that we have this additional source of data on Jupiter and Saturn and their moons prior to the launch of the Mariner Jupiter/Saturn mission in 1977. The infrared telescope will be built on Mauna Kea, Hawaii.

Mr. Chairman, although it is not a new start per se, a significant aspect of our FY 1975 program plans is a legislative proposal that NASA be authorized to enter into a long-term lease arrangement for Tracking and Data Relay Satellite Services (or TDRS services). On March 8, I transmitted to the Congress a bill which would amend NASA's basic charter, the National Aeronautics and Space Act of 1958, to authorize such a contract.

We have for some time been studying the feasibility and practicality of using satellites in synchronous orbit to relay communications directly between spacecraft in low earth orbit and a ground terminal in the continental United States. Such services will greatly improve our earth-orbital tracking and data acquisition capabilities, and, at the same time, permit closing of many of the ground

stations in our present world-wide network now dedicated to spacecraft in near-earth orbit. The technology is ready; its potential contribution to more efficient and cost-effective space operations has been verified; industry is willing and able to provide such services.

If the legislation we are recommending is approved, we plan to solicit proposals from industry late this summer, looking forward to entering into a long-term contract during FY 1975. Under the proposed legislation, although we would be authorized to contract for the TDRS services now -- to accommodate the long-lead times necessarily involved in establishing a TDRS system -- the services themselves would be acquired beginning in 1979; and funds for the services could be obligated only after they are authorized and appropriated to NASA for that purpose. The approach we are proposing will permit us to obtain the tracking and data acquisition services we will need when the Space Shuttle becomes operational, without requiring substantial capital expenditures by NASA during the shuttle development period.

On the institutional side, NASA's civil service employment will be stabilized at the end of FY 1974 levels except for a further reduction of about 350 at the Marshall Space Flight Center at Huntsville, Alabama, related to the completion of the Skylab program. Stabilization of our civil service employment will be extremely beneficial to

NASA. It will permit us to take advantage of normal turnover to employ more young people on whom the vitality of NASA depends and, especially important, give us a better opportunity to increase the employment of members of minority groups and women in NASA.

At this point, Mr. Chairman, I would like to summarize the organizational changes within NASA which went into effect on the 15th of this month and which were reported to the Committee in my letter of March 5 of this year. We believe these changes will strengthen the organization and management of NASA.

As the Committee knows, NASA is going through a period of transition and consolidation. With the completion of the Skylab flights and with Space Shuttle development well under way, Dr. Low and I have recognized the need for a stronger mechanism for an orderly phaseover from conventional launch vehicles to the Shuttle and for innovative and coordinated approaches in planning and developing all our future payloads -- manned and unmanned, science, applications, and technology. In addition, we have felt for some time the need for stronger central leadership of the NASA field centers which are NASA's most important resource and on which the success of all of NASA's activities depend.

We have therefore redefined the position of Associate Administrator of NASA to be the senior line official in charge of the planning and direction of NASA's research and development programs. He is now responsible to Dr. Low and me

for direction the activities of all the Headquarters Program Offices, including Manned Space Flight, Space Science, Applications, Aeronautics and Space Technology, and Tracking and Data Acquisition. Dr. Rocco Petrone who is with us here today, is the new Associate Administrator of NASA. For the past year, Dr. Petrone has been the Director of Marshall Space Flight Center. Prior to that, he was Director of the Apollo Program at NASA Headquarters; before that he was, for many years, Director of Launch Operations at the Kennedy Space Center. Dr. John Naugle, who is well known to the Committee, has been named as Dr. Petrone's Deputy.

The other major change we have made is to strengthen our institutional management by establishing a new position of Associate Administrator of Center Operations as the senior line official in charge of the overall planning and direction of our field center operations. The Directors of the ten major NASA field centers, who in recent years have reported to the associate administrators in charge of program offices, will now report directly to the Associate Administrator for Center Operations, who, in turn, will report to Dr. Low and me.

Dr. Low will serve as Acting Associate Administrator for Center Operations during an interim period until a full time Associate Administrator for Center Operations is named.

Mr. Chairman, the details of NASA's current and proposed programs have been presented to the various subcommittees during the past several weeks. Let me conclude my statement by saying that even within the constrained budgets NASA has had in recent years and has again in FY 1975, I am confident that we can carry out a hard-hitting, useful and exciting program in space and aeronautics, one that deserves the support of the Congress and the Nation.

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## National Aeronautics and Space Administration

FY 1975 AUTHORIZATION REQUEST  
(In Thousands of Dollars)

	<u>FY 1973</u>	<u>FY 1974</u>	<u>FY 1975</u>
<u>Research and Development</u>			
Space shuttle.....	198,575	475,000	800,000
Space flight operations.....	879,000	580,000	323,300
Advanced missions.....	1,500	1,500	1,500
Apollo.....	56,700	---	---
Physics and astronomy.....	126,200	94,000	140,515
Lunar and planetary exploration...	331,969	333,000	266,000
Launch vehicle procurement.....	221,000	175,000	140,500
Space applications.....	188,700	161,000	177,500
Aeronautical research and technology.....	150,640	168,000	166,400
Space and nuclear research and technology.....	81,860	69,000	74,800
Tracking and data acquisition.....	248,331	244,000	250,000
Technology utilization.....	4,000	4,500	5,500
Subtotal, Research and Development.....	2,488,475	2,305,000	2,346,015
<u>Construction of Facilities.....</u>	78,725	101,100	151,490
<u>Research and Program Management.....</u>	721,783	744,786*	749,624
Subtotal, Budget Plan.....	3,288,983	3,150,886	3,247,129
FY 1973 funds applied to FY 1974 budget plan.....	111,000	-111,000	---
Unobligated balances lapsing and other adjustments.....	7,667	---	---
Total Appropriations (FY 1973 and FY 1974) and FY 1975 Authorization Request	<u>3,407,650</u>	<u>3,039,886*</u>	<u>3,247,129</u>

\*Includes \$37,786,000 proposed supplemental for civilian pay raises.